NOTES:

• If the answer to a question is an array, write it using the same "curly-brace" notation that you would use to initialize an array in a declaration.
  
  Example of a one-dimensional array: \{1, 2, 3\}
  
  Example of a two-dimensional array: \{\{1, 2\}, \{3, 4\}\}

• If the answer to a question is an error (for example, a subscript is out of range), just write "Error". You do not need to specify what kind of error it is.

1) (10 points) What will this program print?

```java
class PrintOdds {
    public static void main(String[] args) {
        final int SIZE = 3;
        int[] odds = new int[SIZE];
        int oddNumber = 1;
        for (int i = 0; i < SIZE; i++) {
            odds[i] = oddNumber;
            oddNumber += 2;
        }
        myPrint(odds);
    }

    static void myPrint(int[] a) {
        for (int i = a.length - 1; i >= 0; i--)
            System.out.println(a[i] + " ");
    }
}
```  

2) (10 points) Suppose the following code has been executed:

```java
int[] powers = new int[500];

What is the value of the following expression?

powers[250]
```
3) (10 points) Bill and Hillary have been studying Java arrays this week. Using pair programming, they wrote the following program. What will this program print?

```java
class TripleTest {
    static void triple(int[] q) {
        for (int i = 0; i < q.length; i++)
            q[i] = q[i] * 3;
    }

    public static void main(String[] args) {
        int[] t = {1, 2, 3};
        triple(t);
        for (int x:t)
            System.out.println(x);
    }
}
```

4) (20 points) Suppose the following code has been executed:

```java
int[][] box = { { 7, -4, 0, 9 },
               { -12, 47, 8, 90 },
               { 33, 61, 2, 59 } };
```

What are the values of the following expressions?

a) `box[1][1] + box[2][2]`

b) `box[2][1] > box[1][2]`

c) `box[0].length`

d) `box[2][0] % box[2][2]`

e) `box[2][3] == box[3][2]`

f) `box.length`

g) `box[0][0] + box[2][2] == box[0][3]`

h) `box[1][box[2][2]]`

i) `box[0][2]`

j) `box[1, 3]`

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>49</td>
</tr>
<tr>
<td>b</td>
<td>true</td>
</tr>
<tr>
<td>c</td>
<td>4</td>
</tr>
<tr>
<td>d</td>
<td>1</td>
</tr>
<tr>
<td>e</td>
<td>Error</td>
</tr>
<tr>
<td>f</td>
<td>3</td>
</tr>
<tr>
<td>g</td>
<td>true</td>
</tr>
<tr>
<td>h</td>
<td>8</td>
</tr>
<tr>
<td>i</td>
<td>0</td>
</tr>
<tr>
<td>j</td>
<td>Error</td>
</tr>
</tbody>
</table>
5) (10 points) Suppose the following code has been executed:

```java
int[][] x = { { 0 } };
```

What are the values of the following expressions?

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) x[0]</td>
<td>{0}</td>
</tr>
<tr>
<td>b) x[1]</td>
<td>Error</td>
</tr>
<tr>
<td>c) x[0, 0]</td>
<td>Error</td>
</tr>
<tr>
<td>d) x[0][0]</td>
<td>0</td>
</tr>
<tr>
<td>e) x[x.length - 1]</td>
<td>{0}</td>
</tr>
</tbody>
</table>

6) (10 points) Suppose the following code has been executed (after importing java.util.*):

```java
ArrayList<String> states = new ArrayList<String>();
states.add("Arizona");
states.add("California");
states.add("Nevada");
states.add("Washington");
states.remove(0);
```

What are the values of the following expressions?

<table>
<thead>
<tr>
<th>Expression</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) states.size()</td>
<td>3</td>
</tr>
<tr>
<td>b) states.get(2)</td>
<td>Washington</td>
</tr>
<tr>
<td>c) states[3]</td>
<td>Error</td>
</tr>
<tr>
<td>d) states.indexOf(&quot;California&quot;)</td>
<td>0</td>
</tr>
<tr>
<td>e) states.isEmpty()</td>
<td>false</td>
</tr>
</tbody>
</table>